Vol. V. No. 12. June 4, 1908.

THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

ON MATERIAL REPRESENTATIONS OF DEDUCTIVE PROCESSES

THE difficulty of describing, representing, classifying, mental attitudes without having recourse to metaphors of a "physical" character has long since claimed the attention of philosophers.

They have not failed to draw from it, according to their special preferences, the most opposed and disparate conclusions.

Thus, for example, while Locke ("Essay," III., 2) sees in it a proof and a verification of his thesis "that all our notions originate in sense impressions," Leibniz, on the other hand ("Nouveaux Essais," III., 1), seeks to draw from it conclusions favorable to the doctrine of the "primordiality" of space intuitions (intuitions of direction, distance, motion, etc.).

The advantages and inconveniences inherent in the use of these metaphors offer, however, a field of research which may be described as almost unexplored. The recent publication of a volume calling attention to the importance of this subject has afforded me an opportunity to express some observations on it.[1]

To one who proposes to make a systematic examination of the employment of physical metaphors as a means of representing mental facts two roads are open. As in hydrodynamics, when we wish to observe the motion of a liquid in a tube, we may consider a definite section of the tube, determining the velocity and direction of the various portions of liquid which pass successively through it, or we may, conversely, follow a given portion of the liquid, determining the various velocities and directions which it assumes in crossing the successive sections; thus here we may start from the consideration of a definite image, observing what are the various mental operations which it may be chosen to illustrate, or we may, conversely, start from a definite mental operation, and pass in review the different images by which it can be represented.

For any one having, besides a purely theoretical interest in analyzing the mechanism of mental processes, the comparatively

[1] In *Leonardo*, February, 1905, reviewing Lady Welby's book, "What is Meaning?" (Macmillan, 1903).

practical intent of drawing, from such an analysis, some indications of the means of regulating the play of mental activities, researches of this second kind are found to be more important than those of the first. It is to one of them—that is, to the analysis of the various physical representations of the deductive process—that I propose here to direct the attention of the reader.

The various types of images adopted to express the fact that a given affirmation may be *deduced* from another can be roughly classified under the following headings:

I. Those in which recourse is had to the conception of "upholding" or "supporting," as, for instance, when it is said that given conclusions are "based" upon, or "founded" upon, given premises, or that they "depend" upon (or are "attached" to) them. It is thus that we speak of the "foundations" of geometry, the "basis" of morals, etc.

II. The metaphors of "ascending" or "descending," as when we speak of consequences which "descend" from or may be "traced up" to certain principles, or when we compare the "course" or running of an argument to that of a river, and speak of propositions which "derive" from, "flow" from, "spring" from, "emanate" from, the premises from which they are "drawn."

In this same group we may collect also the metaphors of a biological character, in which consequences are regarded as "generated" from premises, and the premises as "roots," "germs," etc., of the corresponding conclusions.

III. The metaphors referring to the relation of "containing" or "including." These may be subdivided into two groups, according as the conclusion is regarded as "contained" in the premises, or the latter as "contained" in the conclusion. In the first case the premises are conceived as "implying" (*implicare*), in the second as "explaining" (*explicare*), the conclusion which is deduced from them. The deduction is thus often looked upon as an "analysis" or a "reduction," that is, as an operation analogous to the work of a chemist who decomposes a body into its elements.

A characteristic of the first two groups of metaphors, that is, of those by which deduction is referred to as a "supporting" or "a drawing" one assertion by or from another, consists in their lending themselves to the embodiment of one of the most radical objections that can be raised against deduction as a means of proof and ascertainment of truth. It is the objection frequently referred to by Leibniz as "difficultas Paschaliana de resolutione continuata," although Pascal was certainly not the first to raise it. (It has never ceased to be enunciated, under the most different forms, ever since the con-

ception of deduction as a special kind of reasoning first occurred to the mind of the Greek sophists and rhetors.) It consists in observing that all processes in which an attempt is made to prove some assertion by deducing it from another must be based, in the ultimate analysis, upon assertions which, in their turn, can not be deduced from any other, upon assertions, that is, which can not be proved without recourse being had to some other process (induction, intuition, etc.) whose validity deduction can not guarantee; and that, therefore, the certainty which belongs to the conclusions of deductive reasoning can not in any way be held superior to that which we are disposed to attribute to assertions not to be justified by deduction. Deduction, therefore, far from being regarded as the type of mental process conducive to "sure" conclusions, should be looked upon only as a means of causing a greater number of assertions to participate in the certainty, which, quite independently of deductive reasoning, *some* of our beliefs *must* already possess. According to that conception of deductive reasoning, a man who only deduces could not be regarded as a *producer,* but simply as a *distributor* of "certainties"—a retail dealer in a commodity which his activity in no way contributes to bring about.

It is here worth noticing that whatever opinion we may entertain as to the existence or otherwise of premises which have no need of proof, it does not prejudice the question of the greater or less value of deduction, even if considered only as a means of ascertainment of our knowledge. Notwithstanding contrary suggestions, arising from images representing premises as "pillars" or "pegs" by which conclusions are "upheld," the advantages we derive, in regard to the certainty of our opinions, by recognizing that one proposition is deducible from another does not consist exclusively in the participation so acquired by the former in the greater certainty which the latter enjoys. The opposite case, in which the truth or certainty of conclusions, deducible from given premises, is apt to increase and consolidate the certainty of the premises themselves, is no less frequent nor less important to be kept in view. The two advantages are very rarely found separated, in so far as there is hardly any branch of knowledge in which the premises are so indubitably secure that they can not receive further plausibility from their leading to conclusions immediately verifiable, while there is no assertion (except, perhaps, those relating to the so-called direct testimonials of our consciousness, in so far as they exclude all element of prevision) whose degree of credibility may not be, in some measure, increased by its agreeing with the consequences of some previously accepted belief.

The relation between premises and conclusion of a piece of deductive reasoning would not, therefore, be correctly described by saying that the latter is "supported" by the former, unless the common image of one object "supported by another" be substituted by the more general and more scientifically precise one of bodies which are "attracting each other," and which, when in contact, do support each other by reciprocal pressure. Of a pebble resting on a rock it is equally correct to say that the whole earth does support it as to say that the whole earth is supported by it.

Analogous observations may be applied to the image which represents conclusions as attached to the premises by means of a "thread" (or "chain") of reasoning. With this image also, in fact, the diffusion and communication of certainty are ordinarily conceived as acting *in one single direction, i. e.,* from the premises to the conclusions: no notice is taken of the fact that deduction may also act in the opposite direction, in the same way as the rope with which Alpine climbers fasten themselves in a dangerous ascent does. This rope is, in fact, a guarantee of safety to the last as well as to the first, or to any other among those who are bound by it.

Deductive processes in which the certainty of the assertions, which are taken as starting-point, is greater than the certainty of the conclusions to which they lead, are usually termed "demonstrations"; while those in which the contrary occurs, that is, those where given facts are attached to disputable premises, are usually described as "explanations." But the latter as much as the former are "deductive" processes, and in both cases there is the same need of all the apparatus and all the aids by which the operation of deduction may be made easier and more reliable.

To have taken knowledge of this—to have recognized that, even when the premises of a piece of deductive reasoning are less certain than the consequences drawn for them, it continues to be, nevertheless, important to proceed with rigor, with coherence, and with precision—is perhaps to be considered as one of the chief characteristics of the attitude of modern scientific thought as opposed to the one typically represented by Greek speculation. One is tempted to attribute to that circumstance the fact that the latter, while it showed the greatest constructive audacity in those fields in which, as in geometry, the firmness of the starting points (*axioms*) reached its highest standard, on the other hand, in fields, such as physics and mechanics, where this was not the case, it hardly succeeded in raising itself (except in astronomy) above a rough empiricism, as if it had been almost incapable of discerning any connection between facts besides those which offered themselves spontaneously to a

passive observer not availing himself of any coordinating or selective preconception.

A corresponding tendency to depress and diminish the importance of deduction as compared with other processes of reasoning or of research is also countenanced by the metaphors of the third group above defined, *i. e.,* by the metaphors representing deduction as a process of "extracting" from premises that which is already "contained" in them.

To say that the conclusions of a piece of deductive reasoning are to be found, even "implicity," "contained" in the premises, differs, indeed, very little from saying that they not only assert *nothing more,* but even assert *something less,* than what is already asserted in the premises themselves.

We know the manner in which the first great theorist of deduction, Aristotle, tried to carry this objection. He had recourse to another comparison, based upon his favorite contrast between form and matter. That is, he compared the work of one who deduces to that of the sculptor, who, by taking from a mass some of its parts, obtains something of greater value than the mass itself. If, however, instead of a statue he had spoken of an instrument or a weapon—say, of a key or of a dagger—also constructed by removing, from a given place in the raw material, certain parts whose presence would be an obstacle to the end which the instrument or the weapon was to serve, the comparison would have been also adapted to illustrate the power of deduction as an organ for the application of knowledge to the end of acquiring more of it.

In a certain sense the contrast between the process of deduction and that, purely or chiefly passive, of observation, contemplation, registration of the data of experience or of intuition, might even be compared to that between the operations of conscription, intended to secure the service of that part of a population which is fit to bear arms, and the operations of taking the census, directed only to the recognition and description of the state of population in a given country and time.

But, as we have already suggested, there is another direction, exactly opposite to the preceding, in which images referring to the relation of "containing" are capable of being employed as representing the relation subsisting between premises and conclusion in a piece of deductive reasoning. Premises, from which a given conclusion is deduced, may be regarded, not as "including" or "implying," the conclusion itself, but, on the contrary, as the more "simple" elements *of* which it is "composed" or *into* which it may be "resolved." It is the favorite image of Plato, when in the "Theætetus" (200–208)

he compares the fundamental premises of science to the letters of the alphabet (στοιχεία) from the combinations of which result syllables, words, phrases. And it was natural, as the very title of the works of Euclid shows, that this imagery should find special favor among geometricians, since no other is more fitted for refuting the objection of which we have spoken. In the light, indeed, of this comparison such an objection appears little less absurd than an attempt to dispute the genius or originality of a poet or of a musician by observing that all the words or notes used by him are registered in our dictionary, or in our gamut.

To this remarkable advantage which the images of deduction that we have called "chemical" offer in comparison with the other methods of representation before examined, there is, however, a drawback, consisting in their tendency to give rise to a false (too absolute) view of the contrast between simple and complex truths, and to present as the supreme ideal of scientific research the determination of propositions absolutely primordial, non-decomposable, atomic, capable of generating all others by their various aggregations.

This idea is found under its most determined form by Leibniz, in the comparison he establishes of truths with numerals, each of which, if it is not a prime number itself, is always apt to be decomposed, and in manner only, into a product of prime factors.

By such a metaphor as that, we are inevitably induced to lose sight of the fact that the question, whether a given proposition can be demonstrated or not, can only have a meaning if we determine what are the other propositions whose employment is to be permitted in the demonstration required.

When we speak of deduction as an "*analysis*" we must not forget that the properties of such an analysis are very unlike those of chemical analysis. In the latter, indeed, it could never happen, for example, that, among the "elements" out of which a given body is composed, some be found of which the body in question could also be considered as one of the "elements."

There is, in this last respect, a complete analogy between the process of deduction and that of definition. The latter also is, indeed, frequently represented as a process of decomposition or analysis of "ideas," or "notions" (or of the meanings of words), into more simple or more general notions or ideas.

Both the relation of a complex notion to the more "elementary" notions it implies, and the converse relation of the group of individuals, coming under a given complex notion, to the other groups coming under the more "simple" notions by which the complex one

is defined, are found in Aristotle[2] represented by the images of "*containing*" and of "being *contained.*"

Metaphors of the second group above defined, that is, those by which the passing from the premises to the conclusion is qualified as a "descent," and the seeking for the premises of a conclusion as an "ascent," or a "remounting," or "going up," have this in common with those of the type before examined, that they are applicable to the case of deduction as well as to that of definition. Defining also is, indeed, often described as a "tracing up" from particular intuitions to the more general conceptions "*under*" which they are comprised. So in the so-called "tree of Porphyry" the successive ramifications from the trunk represent notions ever more definitely determined, and which are obtained by the gradual introduction of successive specifications and qualifications, in the more general and comprehensive of all classes, *i. e.*, in the class constituted by all "existing things."

An inconvenience, not to be overlooked, which arises from this twofold employment of the metaphors of the last two groups considered—that is, from their being employed at the same time to express the relation between premises and conclusion and that between a notion and the more general notions implied by it—consists in this, that both tend to give plausibility to the conception of deduction as "a passing from the general to the particular," and to make us look upon the greater generality of premises, as compared with conclusions, as an essential characteristic of deductive reasoning. It is difficult to find a different explanation for this mode of conceiving deduction having found favor, in spite of the frequency with which demonstrative processes of quite opposite character (in which, that is, conclusions comprise some of the premises as particular cases) present themselves in the most deductive of sciences,—mathematics.

So far as regards the images which represent deduction as an "*ascent*" to principles, the aforesaid inconvenience is, however, broadly compensated for by the correspondence which they establish between the condition of one who places himself at the point of view of the premises of a deductive process and that of one who, observing a panorama from a height, is in a position to perceive at a glance, between the various parts and regions which are before him, relations which would escape the notice of or be discovered with difficulty by one who was stationed lower down.

An analogous conception is also expressed by the phrases which characterize the process of demonstration or of explanation as a

[2] *τὰ εἰδη τοῦ γένους φασὶν εἶναι μορία · · · τὸ γένος τοῦ εἰδους καὶ μέρος λέγεται.* "Metaphysics," IV., 25.

process of "throwing light," inasmuch as the presence of light has the effect of "economizing experiences" by rendering at once possible the recognition of the respective positions of objects: positions which in its absence could only be determined by subjecting oneself to the shocks and collisions inevitably ensuing from attempts to take direct cognizance of their situation.

Compared with this last metaphor, however, the one first considered, that of "ascent," presents the additional advantage of suggesting, besides the conception of seeing, that of command or power, as when we speak of a "commanding view" or of a height which "dominates" a given region.

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DISCUSSION

STRUCTURE AND GROWTH OF THE MIND

THE publisher of this JOURNAL has been good enough to send me the number of January 16, marking a review of my book on the "Structure and Growth of the Mind"; but it is now March, and the Editor can not welcome a three-monthly discussion in his fortnightly pages. Still all three topics on which the book is challenged fit well the full title of the JOURNAL; they are the brain-and-mind question, the mind-and-experience question, and the subject-experience question. And since my treatment of them, as Dr. Perry presents it, is obviously not worth discussing, and hardly needs repudiating, I may confine myself more to the topics themselves. The only thing about which I should like to complain is his complaint that "there is no contour or difference of emphases, so that reading the book is like swimming under water with never a chance to come up and look about." Repelled by "the undeniable dreariness and obscurity of the preface,"—a couple of pages of print as wide as pica, giving four reasons for not confining psychology to "structural psychology,"—he would not risk the five and twenty pages of contour lines in brevier that follow them. They are, however, a summary of the whole, paragraph by paragraph, which I put at the beginning instead of along the margin, in order that the whole should be read as an exposition of the logic of psychology, and, in particular, an exposition of the theory of the mind in psychology. It is not the mere truth of such a theory that can be in question, but the use of it; hence it is only to be expounded by setting it to work, and not by showing it to hold here, there, and everywhere, like a Spencerian formula with its "Here we are

again." Dr. Perry has read the book as if it were a collection of topics, to which an index would have been more appropriate. He says "there is scarcely any philosophical topic upon which the author does not make instructive comment," whereas I agree with the familiar diatribes of psychologists against all mixture with philosophy. There is no concern with philosophy in the book beyond the prejudices of common sense about truth and reality, which mislead a beginner if they are not pointed out; and they can be pointed out from particular fact without any philosophy. Nor, as regards the three topics, does psychology need anything from philosophy; the plain particular fact—the fact as science knows it—is enough. It is philosophy that needs for its preface their logical treatment in psychology. This is especially the case with respect to the subject-experience, and with respect to the explanation of experience by the mind. But let me take the three topics in Dr. Perry's order.

1. For psychology the brain-and-mind question is how to understand the two as interacting. The essential point is that used by Wundt, viz., they are not coordinate. For then the view that there is a specific brain change for every variety of experience, and the view that there is not, become a matter of scientific hope or faith which makes no difference at all to the pursuit of psychology, and little to the pursuit of neurology. If I commend the faith in the first lecture, I deal faithfully with it in the last; and there is nothing in the book, and nothing prejudged, regarding the real nature of minds and of nature. It is enough for psychology to mark off their real existence from our individual occasional experience of them, and from that alone. So much is enough, but so much is necessary, and it is especially necessary for a beginner on account of the word phenomenon. Strictly this applies to the object in consciousness, or to this plus the real object; but as the application of the word has been extended, two common confusions have taken refuge under it. The first is when it applies to the real object only, —the physical object as science deals with it, "abstracting from its relation to sense," *i. e.*, dealing with it as part of an independent system, or as if it did not need to be felt by any one. "Nature is reality as it is presented to sense, and in order to deal with it as an independent system, we abstract from its relation to sense." This, Dr. Perry remarks, is an "absurd proposition," and passes on. The other confusion is seen in the expression mental and physical phenomena. This use of the word is correct if it means nothing but "known facts," but it is misleading because it professes to mean more. To emphasize this I use the word phenomena in the first meaning,—the meaning it professes, where all phenomena are mental,

—to translate the piece of scientific faith that I have mentioned. Dr. Perry passes on to quote this translation, because it seems to have reached a lower deep than the other. For he exclaims, "Here is parallelism returning with seven other devils," and proceeds to give them body as marks of interrogation. Again, I think it enough to requote what has shocked him: "A mind and its experiences are realities that are presentable to sense as the brain and its actions. In that respect the mind and experience are not parallel with nature, but part of it. And on the other hand, the facts of nature, including the brain, whenever they are phenomena, are not parallel with mental phenomena, but part of them." I need hardly add that I do not recommend any of the uses of the word, and I doubt if I ever happen to use it; for the term "mental phenomena" itself breeds confusion by obliterating essential differences and their connections. With respect to our other two topics, for instance, it ignores the difference and connection between the subject and the object in experience, for it means the whole content of experience, while professing to mean only the object; and it ignores the difference between a mind and its experience.

2. The difference and the connection between what is object and what is not is a more attractive topic for discussion than either of the other two. It is fresher, for one thing, and less formal. But there are too many issues to select from without challenge, and Dr. Perry simply challenges them all, taking the whole question to be as Hume mistook it. He actually believes that the book contradicts itself because it conflicts with the notion of an idle, unanalyzable constant in experience called the feeling of self. (*a*) He begins: "When the subject factor in consciousness becomes in a later moment the object of consciousness, it is held to be the same entity, and must possess identical content." No, the two experiences are two entities—two events—even if they were quite alike, and they are not. The first event is the real object which the second one—the thought of it—means, and of which it claims to be true. The book holds that this true thought is no more and no less a duplication of the content of the first event than if the real object were a physical event; it points out, for instance, that when a desire is made object of attention, it ceases for the moment to be a desire. (*b*) Dr. Perry proceeds: "It must be proper to say that in the previous moment this subject or self was known, at least for purposes of identification; and the subject becomes only one of the objects of consciousness which, like any other object, may pass from margin to focus." But the whole question is whether margin-focus is an adequate description of subject-object. Dr. Perry assumes that it must be, if the subject-experience has variety. For in a foot-note

he quotes the following as a "remarkable statement" to prove that I must mean that the subject-experience is "unanalyzable": "In all experience beyond mere sensation the difference between subject and object is felt. It is not felt as a difference between object and object: we do not think the difference. It is felt as an attitude towards the object." I am at pains to explain how mere sensation develops into the conscious subject-object organization, and how the further development of experience is a development of this organization; and I specify how the subject-experience comes to its organized wealth of content just as the object-experience does. Dr. Perry would think it enough to say that the margin develops a wealth. The marginal part of the object does,—*e. g.*, all that is more or less taken for granted in a thought. But he puts the subject-experience with this, and for no reason but that in neither of them do we make the content the object of attention. (*c*) With the same obsession he quotes: "In seeking any end I must have thought of it and be pleased with it, but I only seek it when I give myself to it and to realizing it," and adds, "Such distinctions are wholly valueless, because they rest neither on the analysis of function nor on the analysis of content, but only on an appeal to experiences which by definition are incapable of verification." The definition is Dr. Perry's assumption; I expressly give the distinctions as an analysis of conscious functions; distinguishing them from the functions that consciousness performs unconsciously, *e. g.*, the formation of habits. The analysis into conscious functions is as clearly separate from the analysis into unconscious functions as from the analysis into conscious elements. Of course, the value of any method of analysis lies not merely in its being correct, but in its use or power.

3. It is on this ground that I have set out the logic of psychology as in the book. It is easy enough to summarize for readers of the JOURNAL; and, as I have said, its exposition is the purpose of the book.

We account for any piece of experience as a reaction on a stimulus or occasion. We draw the line between stimulus and reaction at any point according to the question to which we want an answer. Hence it is always the reaction that we have to explain, including the question why the stimulus brings just this reaction and not some other. There are three sets of factors always present, which together determine the reaction: there is the experience already in the reactor's mind, there is his mind, and there is his body. The last presents a double problem. One is the structure and the action of his nervous system correlative with his mind and his experience. The exposition of this I have called the indirect explanation of the mind and experience, and I have given reasons for taking it up, for

taking it apart, and for taking it after the direct explanation. It need not concern us here. The other physical problem is the influence of bodily conditions on the reaction. This is one of our three sets of factors which the direct explanation must include. A second, as I said, is the experience already present which the stimulus has to encounter; and the third is the mind. All three are always present, but to mix the three together, *e. g.*, a blood-pressure, a counter-attraction, and a disposition, as causes accounting for an experience, gives a very superficial result. The method of dealing with them is this: The third one—the mind—is isolated and made central, not merely because it develops its structure by experience, and this can be followed as the growing power of reacting to the same stimulus, but also for two further reasons. In the first place, the knowledge we thus get specifies the shares of the other two factors as residual effects, and enables us to investigate them. In the second place, it specifies as residual the difference in natural ability of minds, and the growth and decay of the mind apart from experience; for it "provides a scheme whereby all differences in capacity, and in the seasons for learning, can be read and calculated as differences of rate in a common course which is known." All this is set out in the summary, as well as in the text: the central problem and its factors in the last lecture of Part I., its exposition in Parts II. and III., and then the other factors and their investigation in Part IV.

So far the logic of psychology is a matter of method, and its claim to be followed is on the score of clearness. There remains the fundamental question in the central problem itself: How are experiences, and how is the mind (*i. e.*, faculties or dispositions), to be used as causal factors? The use of faculties in the faculty-psychology is an old story, but the use of experiences acting on or with one another may be quite as superficial, whether we are considering their mixtures and combinations, or their mutual furtherance and arrest. It is as if, in dealing with active physical energies, we had regard only to the speed of bodies, and neglected their momentum. The momentum of experiences is a matter of mind or faculty, and they have always momentum.

This requires a clear understanding of the relation of the mind or self to its faculties, of the relation of the faculties that explain to the faculties that have to be explained, and of the relation of the self and its faculties to experience. The last is the third topic on which Dr. Perry challenges my treatment; but instead of doing so on the ground that it does not work, or does little, he appears to think that these analyses are made for their own sake, or as if I were on a mission to save the soul. Perhaps he would not let himself believe that the real mind or self is to be distinguished from

every experience of self, quite as the real object from every experience of it. But the book says no less; nor is there any metaphysical horror behind; even Mr. Bradley has this definition of the soul. I do not understand why Dr. Perry should praise "the wealth of penetrating analysis" in the book; there is nothing but its use to justify anything so tedious, and he does not see its use. When, to take again the case of desire, I distinguish (*a*) the real strength of a desire, (*b*) this as it is felt, viz., a subject-experience, (*c*) one of these as real object of a thought and belief, and, again, (*d*) as it is thought, I should call it all a wealth of pedantry, if it were not necessary in solving problems of the will, and if the solution were singular, and not an application of the general logic. This is the real defect in Dr. Perry's criticism of my treatment of self, faculties, and experience as causal factors, and deprives it of all interest. But I may quote what he says, and follow the quotations with corrections:

"We can eliminate the self because it always functions through one of its faculties." We eliminate self from the list only because we can specify it; but if a student told me that it is specified as one of its faculties, I should suspect him of the faculty-psychology; and if he turned the one into a combination of many, I should be sure of it. "For purposes of explanation, the faculty is not experience" [it never is, whether for description or for explanation], "but operative mental organization; though the reader is encouraged to suspect that it is somehow connected with the experience of self-activity." I am not sure to what this "it" refers, and it does not matter. *Every* experience is reaction of the self on an occasion; and the experience of self-activity is no exception and has no mysterious virtue nor private way of working. It is a very important kind of experience, but that is neither here nor there; its effects, like its causes, are to be explained in the same way as the effects and causes of other experiences.

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THE EXACT NUMBER OF PRAGMATISMS

ANY one who belongs to that group of epistemologists for whom the name of pragmatists has in recent years been adopted, must have read with astonishment Professor Lovejoy's article in this JOURNAL, entitled "The Thirteen Pragmatisms." With astonishment, not so much because Professor Lovejoy has tried to determine the exact number of pragmatisms—there are those who try to determine the exact number of sciences; why, then, not of

pragmatisms?—but because the number of pragmatisms distinguished is so exceedingly small, just a dozen and one. A real pragmatist would easily have been able to distinguish many more, since human life has a good many more aspects than thirteen. But a pragmatist, I fear, would scarcely have taken interest enough in the matter to make these distinctions. Professor Lovejoy claims for his list that it "includes all the genuinely independent contentions that are most frequently illicitly identified, and all the ambiguities of meaning. . . ."

I can not help asking this question: When three men, one a physicist, the second a chemist, and the third a biologist, write three books, a text-book of physics, a text-book of chemistry, and a text-book of biology, is it justifiable to call the contents of these books "genuinely independent contentions"? I think it is not; and I do not see why it should be more justifiable to regard the views of the thinkers criticized as independent contentions. So far as I can see, all these views are in one way or other dependent on each other, for they are all—mathematically speaking—functions of one and the same variable, of the progress of human life. The illusion of their mutual independence is obviously due to the fact that these functions (imagine algebraic and transcendental functions!) are so different in form that, seeing this conspicuous difference, one is apt to overlook the fact that they are functions of the same variable and that, therefore, they are not mutually independent. To the pragmatist Professor Lovejoy still owes the proof of his assertion that the views criticized are "genuinely independent contentions."

I must raise another question. When the physicist, the chemist, and the biologist, meeting at a convention, put their books on a table and, asked by an outsider what those books are, call them text-books of "science," has this outsider any right to accuse them of having "illicitly identified" their so-called independent contentions? Right or no right, there will always be those who are ready to accuse them, but the scientists, being pragmatists, will nevertheless continue to put their books together on the table or the shelf.

A third question. Professor Lovejoy exposes to public scorn "all the ambiguities of meaning that are so central and important as to call for serious consideration from both the defenders and the critics of the several opinions to which the one name has been applied." I shall have to leave the question open whether these ambiguities of the meaning of pragmatism are central or not, for the simple reason that the word "central" is so ambiguous that I should not care to enter into a dispute in which this word would play the chief part. But I do not feel inclined (as a pragmatist) to admit that these ambiguities are "important." *Science* is getting

along fairly, although the meaning of this word is so ambiguous that a hundred scientists asked to define science would probably give a hundred more or less differing definitions. Why should not *pragmatism* get along equally well, although a hundred pragmatists —if their number is already as large as that—would probably give a hundred more or less differing definitions of pragmatism?

I shall try to show by an example that the distinctions made by Professor Lovejoy are—to a pragmatist—of minor significance and hardly capable of bringing discord into the camp of those who swear by this epistemological theory. The distinction I wish to discuss is that between "the meaning" and "the truth" of a proposition. He refers to this distinction in the following words: "Pragmatism maintained that the meaning of any proposition whatever is reducible to the future consequences in experience to which that proposition points, consequences which those who accept the proposition *ipso facto* anticipate as experiences that somebody is subsequently to have. Now, a theory about the meaning of propositions is not the same thing as a theory about the criterion of truth in propositions." And farther on he makes a distinction concerning the "meaning" in the following words: "Future consequences in concrete experience may consist in either: (*a*) future experiences which the proposition (expressly or implicitly) predicts as about to occur, no matter whether it be believed true or not; or (*b*) future experiences which will occur only upon condition that the proposition be believed." These "have been habitually confused in the discussion of the pragmatic theory of meaning." Thus, by making one division first, and another one, a subdivision, later, Professor Lovejoy succeeds in distinguishing the first three of his thirteen pragmatisms.

Reading this, and finding myself unable to assent, I follow the custom of the scientist and call up in my mind a particular case, a special scientific "truth and meaning," in order to make clear to myself why I can not assent. The high school boy is taught by his teacher in physics that "light consists of ether waves." Is this a truth or a meaning? The proposition surely has a meaning, for it would scarcely have found its way into the text-books if it were meaningless. And it has truth, too, for the same reason. Can we, then, take away its truth and leave its meaning; or take away its meaning and leave its truth? Certainly no scientist would admit this. The proposition has meaning just so far—neither more nor less—as it has truth. It has truth because it calls up in our minds mathematical formulas by means of which we can reconstruct in a convenient manner in our minds certain very numerous and complicated visual experiences, formulas which have previously served to reconstruct in our minds our experiences with water waves or

the waves running along a clothes line. And exactly herein, in calling up these formulas ready for use, consists also the meaning of the proposition. (For further particulars see Mach's "Mechanik" or his "Wärmelehre," or the writings of Stallo or Poincaré.) If truth and meaning can not be divorced in science, if there they are merely two words symbolizing the same fact, it is unlikely that they can be divorced in pragmatism, since pragmatism is nothing but a highly generalized, an epistemological statement of the principles which are in daily use in the special sciences.

When the high school boy goes to college and takes a course in the theory of light and electricity, it may be that his teacher does not say a word about ether, and in reply to a direct question perhaps advises the boy to free himself from that notion altogether. Neither does the teacher speak of waves, but perhaps of the distribution of energy in time and space, pointing now at this, now at that one of the mathematical formulas which he derives and constructs in order to represent this distribution, and calling these formulas, not waves, but simply periodical functions. Here is an opportunity for the opponent of pragmatism to step in and assert that this proves that the proposition "light consists of ether waves" has lost its truth, while it has retained its meaning. But apparently only. It has by no means lost its truth. Only by ceasing to have a meaning can a proposition lose all of its truth. The teacher does not call it a truth, because he, personally, under the present circumstances, has no use for it. He is like a workman who has two spades, one sharp and the other dull, and, when asked why he does not use the dull one, would say in derision: "Well, that is no spade at all." And yet, another workman, unable to buy a spade, might gladly accept the dull spade and use it. And the first workman will admit, this time, that it is a real spade, without minding a third person's accusing him of being guilty of a so-called logical contradiction. Just as a spade may be a spade in a higher or less degree, so a truth may be a truth—shocking as this may seem to one who is not a pragmatist—in a higher or less degree. It ceases to be a truth only when it has lost all meaning.

"But I can not see that this really follows," Professor Lovejoy tells us. "The assertion 'God exists and mere materialism is false' may possibly mean only the anticipation of a cosmic future different in specific ways from that which the acceptance of the contrary proposition would lead one to expect; but the criterion of the truth of the assertion need not be correspondingly future." In order to prove this, he points out that we may *be obliged* to accept the proposition as a true postulate *now,* before we have experienced that cosmic future. It is strange that he should have failed to see that

being obliged means a relation of the present biological condition of an organism to its *future* biological condition. A rock, which has no life, never *is obliged.* A definition of truth which has no reference to the biological future of an organism is an absurdity. To escape this reference to a future is impossible. We certainly do not escape it by seeing to it that the word "now" appears in the sentence which expresses our argument. "That the pragmatic man never is, but always is about to have been, blest with knowledge" may have been intended to make him appear ridiculous. But the pragmatic man is not only willing to accept the word as a truth, but is even ready to put it proudly as a motto upon his shield.

As woman was created from a rib of man, so Professor Lovejoy's third pragmatism is created from a piece of the second pragmatism's skeleton, from those future experiences which occur only in case the proposition is believed. But as man and woman in a certain sense are biologically one, so these two pragmatisms are one to the pragmatist.

At the first glance it seems very plausible that, if the meaning of a proposition is reducible to the future experiences *to which that proposition points,* its meaning can not well be reducible also to those future experiences *which occur only in case the proposition is believed.* But the apparent importance of the distinction vanishes when we take time to scrutinize it. Let us assume that the proposition in question is this: "The temperature in heaven is lower than the temperature in hell." What are the future experiences of the first class, to which this proposition points? There are in this case none at all. Who has had these experiences before? Even the most orthodox believer is unable to tell us that any of his friends, who have just returned from an excursion to these places, have made a report to that effect; or that he has found a description of such an excursion in a book which he has reason to regard as a reliable source of historical information. No pragmatist can admit, therefore, that the proposition "points" to any future experiences of temperature. But while the proposition does not symbolize what could be called by the pragmatist, in any of the senses accepted by him, future experiences of temperature, the pragmatist readily acknowledges that the word images, of which the proposition is composed, have often occurred together in human minds, accompanied by vivid imagery of the visual, the temperature and other sense departments, and that they have undoubtedly been followed by future experiences of religious emotion, of moral conduct, of giving away money for the erection of a church, and many others. What, then, are, to the pragmatist, the future experiences to which this proposition points? Certainly not those of temperature, but exclusively those of the sec-

ond class, just exemplified. If it had not been for the future experiences of this kind, the church of the middle ages would never have called this proposition a truth. And for the very reason that these "future" experiences no longer succeed the consciousness of the proposition, although temperature images may, and naturally often do, succeed a consciousness of the words, the modern church no longer, at least no longer generally, calls the proposition a truth. We see here again the identity of meaning and truth. The proposition's meaning does not consist, pragmatically, in temperature imagery, but in the conduct of human life anywhere, that is, in its biological significance for human beings. As soon as this *meaning* is lost, the *truth* has likewise ceased to exist. As soon as the proposition has lost its *truth*, it has, as a proposition, also lost its *meaning*, although the linguistic elements of which it is made up, continue to appear familiar and to call up all kinds of other images of words and things.

The question as to the exact number of pragmatisms is easily answered. Just as there are really as many sciences as there are scientists, so there are as many pragmatisms as there are pragmatists. Count them! But however great the number may be, neither science nor pragmatism is any worse off on that account.

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REVIEWS AND ABSTRACTS OF LITERATURE

Aspects of Child Life and Education. Compiled by G. STANLEY HALL. Boston: Ginn & Co. 1907. Pp. xii + 326.

This book is made up of a series of nine articles written by G. Stanley Hall and some of his students. All these articles have appeared previously in some journal, most of them in the *Pedagogical Seminary*, but they are here "revised, condensed, or amplified, and provided with up-to-date bibliographies on each topic." By publishing them in book form Dr. Hall hoped to emphasize the relations between the different parts of the domain of child study, and by contrast to set forth their manifold applications.

The articles differ considerably in importance,—some are of interest from an historic point of view, others because of their practical bearing on the education of children. Of the former, the paper "The Contents of Children's Minds on Entering School," published twenty-five years ago, marked the beginning of the child-study movement in America, while "The Story of a Sand Pile" and "Boy Life in a Massachusetts Country Town Forty Years Ago" are probably two of the best-known single articles Dr. Hall has written. Of the second group, the paper on

"The Collecting Instinct" and the one on "Curiosity and Interest" offer many suggestions, some of which are now being worked out in the methods and materials used in teaching. The questionnaire method has been used throughout as the means of securing material, but as this method has been criticized elsewhere it is enough to mention the fact.

The book opens with Dr. Hall's historic article on "The Contents of Children's Minds." It summarizes the results of the Berlin study, those of Dr. K. Lange, Dr. B. Hartmann, and J. Olsen, as well as his own study of Boston children. The general conclusions are: (1) That there is next to nothing of pedagogic value the knowledge of which it is safe to assume at the outset of school life. Hence the need of objects and the "danger of books and word cram." (2) The best preparation parents can give their children for good school training is to make them acquainted with natural objects, especially with the sights and sounds of the country, and to send them to a good kindergarten. (3) Every teacher on starting with a new class or in a new locality should find out, with all the tact and ingenuity he can summon to his aid, what is already known by his class. (4) The concepts which are most common in the children of a given locality are the earliest to be acquired, while the rarer ones come later. Boys seem more likely than girls to be ignorant of common things right about them. (5) The actual content will depend on the environment of the children tested; the results gained from one locality can not be assumed to be valid for another district. Much of this seems like an old story, so thoroughly have we incorporated these conclusions in our principles of teaching. Still every teacher is probably making mistakes along just this line, and an examination of the tables presented in this study will mean time saved later, in that it will result in still greater caution in crediting young children with knowledge common among adults and will emphasize afresh the need of the application of the well-worn principle of apperception.

The second paper, "The Psychology of Day-dreams," by Theodate L. Smith, is interesting, though, perhaps, of little pedagogical value. It is based on answers to a questionnaire which was sent to normal-school students, pupils in the grammar grades, and adults, and may be summarized as follows: Day-dreaming appears to be a normal and well-nigh universal phenomenon in children and adolescents, and may continue throughout life. With the dawn of adolescence there is a marked increase in the variety and complexity of content. The emotional element becomes prominent. Sex differences are especially marked in day-dreams, largely due to environment and conventional training, but possibly due to some extent to innate, fundamental differences between men and women. In childhood the dreams are made up of memory images, actual experiences, and stories, being reproduced with but little change. Eating and motor activities figure largely in the content of childish dreams. In adolescence the dreams are of a vague future, with boundless possibilities, and of love. Those of the adult seem to be in closer connection with actual life. In old age the day-dreams are memories of the remote past. Day-dreaming may become excessive and pass over into pathological

states; and in consequence of the fact that it is usually enjoyable, a passive state, and that it is often associated with high intellectual endowments, it is peculiarly liable to this danger. It is interesting to note that many of those who indulged in it frequently had some sense of moral wrong-doing—children often vaguely, but youth often definitely and strongly.

The paper on "Curiosity and Interest," written by G. Stanley Hall and Theodate L. Smith, is one of the most interesting and suggestive from a pedagogical point of view. The results seem to support the statement made by E. A. Kirkpatrick, that "curiosity alone is a sufficient motive for the invasion of every fresh field of knowledge." The material was collected mainly from answers to syllabi, the total number of which was 1,247, and also from some individual child biographies kept by mothers. From a careful examination of these records it is concluded that four stages of development are recognizable: (1) Passive staring, manifested in infants as early as the second week. (2) Surprise, usually noticed in the second month. (3) Wonder, a little later than surprise. (4) Interrogation, or curiosity proper, which appears about the fifth month. Interest and curiosity are shown with regard to sensations in the following order: sight, hearing, touch and muscle sensations, smell and taste. These do not successively predominate, but overlap. Curiosity is manifested by (1) observation, passive and active; (2) experiments, under which is a discussion of cases of apparent cruelty; (3) questions about (*a*) forces of nature, (*b*) mechanical forces, (*c*) origin of life, (*d*) theology and Bible stories, (*e*) death and heaven; (4) destructiveness; (5) desire to travel. The records and discussions of questions asked by children are of vital importance to teachers as showing the vast amount of natural energy and intelligence which they have at their command, and also as emphasizing some of the particular lines along which children ask for information and need instruction. Aimless curiosity is rare, and in normal children is a sign of fatigue. Curiosity and attention go hand in hand in development, and lack of either shows either mental deficiency or poor pedagogy.

"The Story of a Sand Pile," by G. S. Hall, reads almost like a "Robinson Crusoe" written for adults. It is the account of how a few boys, during several summer holiday seasons, worked out in their play, with a sand pile, various stages of community, social, and industrial life. This sketch illustrates in a telling way many of the pedagogical principles which are being emphasized in the present-day methods of teaching, and also it shows what boys can and will do if left to themselves in a suggestive environment.

"A Study of Dolls," by A. Caswell Ellis and G. Stanley Hall, is based on 648 answers to a questionnaire from normal and high-school students and some adults. The results are summarized, and given in detail, under the following headings: materials of which dolls are made, substitutes and proxies; psychic qualities; dolls' food and feeding; sleep, sickness, death, funeral and burial of dolls; dolls' names; discipline; hygiene and toilet; families, schools, parties, etc.; accessories. I quote

some of the most interesting conclusions. The educational value of dolls is enormous. It educates the heart and the will even more than the intellect, and to learn how to control and apply doll play will be to discover a new instrument in education of the very highest potency. The individuality of children is more clearly revealed in the characters they give their dolls than in their own traits. The returns do not show any law of relationship between the size of the doll and the size or age of the child, save that the extremes of large and small develop their chief charm well on in the doll period. Doll play is an early cropping out of mother love, only in a limited and partial sense, and there must be much readjustment of opinion on this point. Some mothers very fond of their children now never cared much for dolls, while unmarried women and childless wives have been most enthusiastic devotees of dolls. Indeed, it is just possible that the ideal mother never played dolls with great abandon. Certainly, other functions than the maternal are more pronounced, for the play also seems natural for small boys. Dolls could aid in teaching almost everything. Some children read stories in order to be able to tell them to their dolls, others practise their French upon them. Many learn to knit, sew, etc., design costumes and prepare food for their dolls. Could not children's interests in and attitudes towards dolls be used to teach rudimentary sociology, ethics, science, anatomy, etc., in their most-needed and effective form? Dolls are a good school for children to practise all they know.

The paper on the "Collecting Instinct," by Caroline Frear Burk, is one of the most suggestive of the series. The study is based on the records of 1,214 children, from six to seventeen years of age, and concerns itself with the following questions: universality of the instinct; distribution of interests by age and objects collected; stages of development; methods of collecting; arrangement of collections. "The collecting instinct, passion, or interest is wonderfully universal and wonderfully intense among children. The age at which it is of greatest pedagogical importance is largely in the preadolescent period, before which collecting is more or less a blind, groping, purposeless instinct, and after which it largely loses its purity by being bound up with other associates, but during which period it reaches its greatest intensity and genuineness. Here we find the greatest reveling in quantity, here the time when the instinct acts most easily through the incentive of wide imitation, here rivalry comes in to add zest, here the true naturalist's spirit of finding and hunting as opposed to receiving or buying is most prominent, here the beginnings of a sense of classification develop. Here we find the nature interest at its crest, and this is the time for sending children forth to gather in nature's stores, to let them roam and wander and to encourage their naturalist clubs." Besides these nature-study collections a remarkable variety is shown in the kinds of things children collect. What they collect seems to be largely the result of circumstance, environment, suggestion, or imitation, but to collect something seems to be an instinct *per se*.

"The Psychology of Ownership," by Sinus W. Kline and C. J. France, is "an attempt to investigate the origin and nature of the instincts and

motives that operate in the accumulation of property and to describe more thoroughly than heretofore attempted those mental states arising from the consciousness of things owned." The paper is based on material gathered from biological, anthropological, historical, and child-study sources. The conclusions from the study of the child's attitude towards property seem to be the most definite and practical. Property is a great factor in developing the mind of the child, in teaching him about himself, in developing self-consciousness, enlarging his personality, and in teaching him respect for property in others. All that property has done in evolving the mind of man is repeated to some extent in the history of childhood. Above all, property-getting in childhood is of prime importance because it is anticipatory. The pedagogical value of children's collections is pointed out in this connection, and the question is raised as to whether, in furnishing children with books and other school appliances without giving them outright, we do not violate this property sense and detract from the child's dignity and self-respect, for "property is the very backbone of personality."

"Fetichism in Children," by G. Harold Ellis, is a short paper stating the things children use as fetiches and the significance of the whole attitude. The recapitulation theory is urged as explanation for many of the objects regarded as charms as well as for the tendency in general. Mr. Ellis believes that in the child are found all the elements that, united, make man a religious being, and that though intellectually we have risen above the savage, emotionally we are at about the same level.

The last article of the series is Dr. Hall's "Boy Life in a Country Town Forty Years Ago." It might have been called "The Disadvantages of Progress," for in it the author portrays the environment which he considers the best for boys between the ages of ten and fourteen, namely, that of the New England country town of about forty years ago. This life, according to the author, combines physical, industrial, and technical with civil and religious elements in wise proportion and pedagogic objectivity; it is "the one and only one that represents the ideal basis of a state of citizen voters as contemplated by the framers of our institutions." Dr. Hall then goes on to give some of the occupations, serious and otherwise, of the men, women, and children of this time. How the men made their ax helves, butter paddles, flails, bread troughs, cheese hoops and cheese ladders, scythes, pop-guns, etc., while the women were expert in carding, weaving, and spinning, the wool used being shorn from their own sheep and the flax raised in their own fields. Besides having some share in all the industries of the farm, there were all the outdoor sports and games for boys and girls,—so many more than we have to-day! Then there were the evenings spent in the light of home-made candles beside open fires, with the husking bees and paring bees, quilting bees and patching bees, spelling and singing schools, and stories without number. These evenings were not dangerous to morality, but turned to good account. "The farm was a great laboratory, tending, perhaps, rather more to develop scientific than literary tastes, cultivating persistency, if at the expense of versatility. Some such training the heroes of '76 had; . . .

such a people can not be conquered, for war and blockade would only drive them back to more primitive conditions and restore the old independence of foreign and even domestic markets." Although, perhaps, most people would not quite agree with the cry that the old times were the best, yet as one reads Dr. Hall's descriptions of all the possibilities of those strenuous times and realizes the limitations under which the majority of city children of to-day labor, one must echo afresh the cry that is being heard on every side for more that is vital, living, and real in the education of the children of our public schools.

To have such a series of articles published in book form, instead of scattered through various periodicals, will be a boon to many a teacher and educator. One is tempted to wonder what the principle of selection was which governed the compiling of the book, and, perhaps, to wish for a little unity of material in such a book; but as Dr. Hall in his preface acknowledges this lack and promises better things of others which may follow, we can afford to rest content.

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An Outline of the Idealistic Construction of Experience. J. B. BAILLIE. London: Macmillan & Co. 1906. Pp. 344.

The book divides itself into two parts. The first portion is an enunciation of the view-point of the writer and lays down the principles governing the book as a whole. The second part, which begins with Chapter V., is a statement of experience according to the general plan contended for in the first four chapters of the book. The first portion of the book is unquestionably the more important of the two, for if the contentions of these earlier chapters are admitted, the remaining chapters, so far as their general scheme is concerned, follow quite readily. In other words, the author (Professor Baillie) first constructs and defends his main principles and position; and then, having done this, the application of the same, or the fitting of the different kinds of experience together in accordance with the theory previously set up, becomes a comparatively easy task as a whole although attended with difficulties in certain instances. Of the first division of the book mentioned above, Chapter I. (introduction) is the most important and the most difficult to understand of the first four chapters. This introduction, so called, is in fact the crucial chapter of the entire work, and if the main contentions of this part of the book are admitted as substantiated, the criticism that may be directed against the rest of the book is more of the nature of detail criticism than otherwise.

That Professor Baillie's line of thought is Hegelian will hardly be denied, yet this is, perhaps, all that can, in fairness, be said of the relation of this book to the philosophy of Hegel. There is an undoubted Hegelian trend of thought found herein, which is, perhaps, to be expected from one who is the author of "Hegel's Logic." However, "Idealistic Construction of Experience" is not a rehash of Hegel by any means and does not approach as closely to Hegel in many particulars as has

been suggested. Professor Baillie may be the most "orthodox" of present-day Hegelian writers, as stated by Professor Hoernlé, but, be that as it may, Professor Baillie is not Hegel by any means. Did the time permit, I would like to point out certain differences between Professor Baillie's idealism as enunciated in this book in question and Hegel's idealistic philosophy. It may be mentioned in passing that it would seem hardly fair for some critics of Professor Baillie to say, on the one hand, that it would be better after all, instead of trying to Hegelianize a new idealism, to return squarely to Hegel, and, on the other hand, to say that Professor Baillie has taken no notice of the philosophical work that has been done since 1806.

The endeavor that is made in this book to do justice to pragmatism and idealism alike is a commendable one and shows a philosophic rather than a partisan spirit. The question is whether the author has actually succeeded in doing this or not. For those who are not pragmatists the question especially arises whether Professor Baillie has not sacrificed more of idealism than of pragmatism in this attempted union of elements of each. This remark applies more particularly to his discussion of these two philosophical movements in the first part of the book than his actual systematic construction of experience later on. The attempt that is made in the above regard is by finding some element common to both individual and universal experience—which last is, according to the author, also individualistic in a way, *i. e.*, it falls within individual experience and we part with universal experience *per se*. This common feature is purposiveness. This last, then, is of marked importance, it would seem, for Professor Baillie's construction of experience, and yet the surprising thing is that it has received so little attention at his hand. Moreover, the way or reason for the statement as regards the alleged fact that purposiveness is the means whereby the union and destination of the individual and universal elements in experience are to be made, is not made plain. The writer makes the unqualified statement that this is so, and leaves us largely in doubt as to whether we should accept this as true or not. Again after a brief mention of purposiveness here, it apparently drops out of sight, as I do not recall any further mention of it. This may be accounted for inasmuch as "purposiveness" only serves a purpose with the writer, albeit an important one, so far as the principle deduced from the use here made of purposiveness is concerned. The purposiveness in the various phases of the individual life is to establish consciously the sense of unity in the individual experience. It seems strange that Professor Baillie should have left the reader in any doubt as to why this unification of experience is of such importance—"the one supreme fact." In the absence of any detailed presentation of a question of such moment, it must appear as if this position on the part of Professor Baillie is an assumption. This "unity of experience" is the crux of the entire book. Thus it would seem as if particular pains should have been made to elucidate and ground this vital point of the entire book. "Value," "validity," and "significance" have meaning, he says, just in reference to this one point. Here Professor Baillie becomes some-

what enamoured of the pragmatist's doctrine. The test of value is that a theory has "worked out," viz., has contributed to the securing of the desired unity, which is that which is always aimed at in experience, he declares. It is true that the author accords an objective validity to this unity, but this so-called "objective" gives one the after-taste that it is just about as subjective as objective.

It would seem as if the author's treatment of universal experience, although not really inconsistent, would at times give an impression which might be misleading. We are told that the reality of universal experience *per se* must be abandoned, and yet he says that "the process of history is the way in which it [universal experience] appears." Its appearance in the course of historical experience is obviously not the experience of the mere individuals composing the historic groups, which last would be their combined experience, not *its* experience, which must, from a statement like the above, be considered as something apart from the aggregation of separate experiences. If it has an experience of its own, even though this finds manifestation or realization in the historic experiences of individuals, yet, after all, this is not identical with the individual experiences, but is something apart from them, hence it has a reality of its own; and this last point should not be obscured by the more extended denial of the reality of "universal experience *per se*" (as the author so frequently says) which Professor Baillie carefully points out. His position here might be characterized as the Aristotelian rather than the Platonic.

Conception and judgment receive scant respect at the hands of Professor Baillie. These are "devices for saving time," yet find their justification for existence or use in that they are aids to the unification of experience, which last is, first and always, the criterion, or point in relation to which, all else is to receive its orientation. Conceptions are consciously selected to reach the sought unity. If they accomplish this result, they are true; if not, untrue. The end of knowledge is presentational unity. I can not but feel that Professor Baillie's estimate of knowledge is an inadequate one. It is pragmatic, and yet smacks of Kantianism.

There is developed in Chapter IV. a point which is of importance as regards the general method pursued by the writer in the construction of experience. According to Professor Baillie, experience is explained and rationalized if the connection of its different phases is shown. To state the connectedness of experience is to indicate its necessity and rational character. Each part is to be assigned its appropriate place in the scheme of the whole, and if this can be done, the writer maintains, that experience will thus be self-explaining. This is an attempt to give a logical, schematic character to experience, which plan is worthy of careful thought. The question is whether this will "work out," and hence, to use an earlier criterion of the author, have validity. Professor Baillie apparently anticipates a criticism that might be brought here; and this criticism is, how are we to know that any particular connection or arrangement of the moments of experience is, after all, the correctly

connected order? Might not some one else challenge our arrangement, which we may make in all confidence, and find adherents to his new plan of experience? The statement that the method whereby this scheme of experience is a combination of both subjective and objective elements, would seem to arouse the anticipation that perhaps a true and unassailable connection is to be given. It is to be an "absolute" connection. After all that Professor Baillie has to say upon the subject of the connection of experience, he virtually introduced nothing new here. He returns to what has been already emphasized, viz., unity of experience. This last is something of great import for the entire book. This same fourth chapter deals to quite an extent with the thought that experience is self-explaining, that the explanation of experience is to be found within experience itself, etc. This seems almost a truism when the term experience is used in the broadest sense, as it is so used by Professor Baillie. As used by him, everything known, felt, etc., comes within experience, and, of course, there is nothing for us that is without experience; hence the explanation and connection or anything else pertaining to experience is within the breastwork of experience. However, this chapter in question will well repay careful reading, and it is on the whole a forceful incentive to meditation along the lines which it takes.

Despite its undoubted faults, this book is, on the whole, worthy of serious consideration in these days of somewhat superficial philosophical thinking.

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JOURNALS AND NEW BOOKS

THE PHILOSOPHICAL REVIEW. March, 1908. *The Problem of Truth* (pp. 114–137): H. N. GARDINER. – Truth is concretely a property of particular truths expressed in propositions. In this sense truth is not a defining quality of real beings. We must distinguish in cognition the act or process, the object and the meaning of the sentence in which truth or falsity is predicated or denied of a proposition. True and false are primarily predicates of this meaning. The chief objection to pragmatism is its difficulty in accounting for the universality of truth. *Subjectivism and Realism in Modern Philosophy* (pp. 138–148): NORMAN SMITH. – The contradiction in subjective idealism is in the conception of mental states related to objects as their cognitive apprehensions and also as their mechanical effects. Realists should examine exhaustively the theories of Avenarius and Bergson, that the brain has a motor and not a cognitive function. *Green and Sidgwick on the Community of the Good* (pp. 149–166): G. F. BARBOUR. – Green held that the true good has a common and non-competitive character. Sidgwick opposes this position. Reconciliation is possible by regarding the common non-competitive good as an ideal and regulative principle. The claim of

ethics to be a normative science justifies such normative principles. *Proceedings of the Seventh Meeting of the American Philosophical Association* (pp. 167–190). *Reviews of Books:* Rashdall, *The Theory of Good and Evil:* W. CALDWELL. Lipps, *Aesthetik: Psychologie des Schönen und der Kunst. Zweiter Theil:* J. H. TUFTS. Riley, *American Philosophy. The Early Schools:* E. L. VAN BECELAERE. Bakewell, *Source Book in Ancient Philosophy:* H. N. GARDINER. *Notices of New Books. Summaries of Articles. Notes.*

Allan, Andrew. *Matter and Intellect.* A reconciliation of science and the Bible. London: A. Owen & Co. 1908. Pp. 224. 5s.

Driesch, Hans. *The Science and Philosophy of the Organism.* The Gifford Lectures delivered before the University of Aberdeen in the year 1907. London: Adam and Charles Black; New York: The Macmillan Co. 1908. Pp. xiii + 329. $3.00 *net.*

Hardy, T. J. *The Gospel of Pain.* London: George Bell & Sons; New York: The Macmillan Co. 1908. Pp. 223. $1.25 *net.*

Marie, A. *La pellagre.* Paris: V. Giard & E. Brière. 1908. Pp. 250. 4 fr.

Rey, Abel. *La théorie de la physique chez les physiciens contemporains.* Paris: Felix Alcan. 1907. Pp. v + 412. 7.50 fr.

Rey, Abel. *L'énergétique et le mécanisme au point de vue des conditions de la connaissance.* Paris: Felix Alcan. 1908. Pp. 186. 2.50 fr.

Stocker, R. Dimsdale. *Spirit, Matter, and Morals.* London: A. Owen & Co. 1908. Pp. 97. 1s.

NOTES AND NEWS

TO THE EDITORS OF THE JOURNAL OF PHILOSOPHY, PSYCHOLOGY AND SCIENTIFIC METHODS

GENTLEMEN: In a recent review of Dr. R. M. Yerkes's book on "The Dancing Mouse," I made the statement that a satisfactory demonstration of Weber's law could not be obtained for the brightness vision of the dancer. In rereading Dr. Yerkes's conclusions, I find that he does state that ". . . a difference of one tenth is sufficient to enable the animal to distinguish two lights in the case of the three standard values, 5, 20, and 80 hefners." He states, furthermore, that when the difference was made one fifteenth, the animals could no longer make the discrimination.

JOHN B. WATSON.

UNIVERSITY OF CHICAGO,
May 16, 1908.

THE George Washington University has established a separate department of psychology, with Williston S. Hough, Ph.M., Shepherd Ivory

Franz, Ph.D., and William Carl Ruediger, Ph.D., as teaching staff. There are to be two psychological laboratories, one for elementary class instruction and experiments bearing on educational problems, and one for the advanced research work of graduate students.

DR. A. E. DAVIES, assistant professor of philosophy in the Ohio State University, has been advanced to the rank of professor of philosophy.

DR. T. H. HAINES has been promoted, at the Ohio State University, from assistant professor of philosophy to professor of psychology.

DR. I. WOODBRIDGE RILEY has been appointed to the chair of philosophy at Vassar College.

The Philosophical Review will be published henceforth by Longmans, Green and Company.